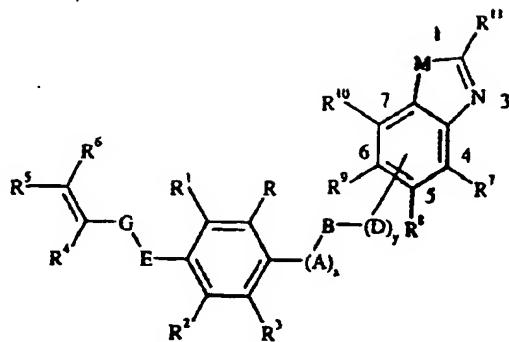


What is claimed is:

1. A compound of formula I:



I

wherein

-R and R³ are independently selected from hydrogen, halogen, hydroxy, (C₁-C₃)alkyl, (C₃-C₆)cycloalkyl, (C₂-C₅)alkenyl, (C₂-C₅)alkynyl, halo(C₁-C₃)alkyl, (C₁-C₃)alkoxy, halo(C₁-C₃)alkoxy, (C₁-C₃)alkylthio, halo(C₁-C₃)alkylthio, (C₁-C₃)alkylsulfonyl, halo(C₁-C₃)alkylsulfonyl, cyano, nitro; optionally substituted amino wherein the optional substituent is selected from (C₁-C₄)alkyl, (C₁-C₃)alkylcarbonyl and (C₁-C₃)alkoxycarbonyl; optionally substituted imidazolyl, optionally substituted imidazolinyl, optionally substituted oxazolinyl, optionally substituted oxazolyl, optionally substituted oxadiazolyl, optionally substituted thiazolyl, optionally substituted pyrazolyl, optionally substituted triazolyl, optionally substituted furanyl, optionally substituted tetrahydrofuranyl, optionally substituted dioxolanyl, optionally substituted dioxanyl, -C(=J)-K, and -C(R¹²)-Q-R¹³, wherein the optional substituent is selected from (C₁-C₄)alkyl, halo(C₁-C₄)alkyl, (C₁-C₄)alkoxy, (C₁-C₄)alkoxy(C₁-C₄)alkyl, (C₃-C₆)cycloalkyl, (C₂-C₅)alkenyl, (C₂-C₅)alkynyl, cyano, nitro and aryl;

where

J is selected from O, S, NR¹⁴, and NOR¹⁴, where R¹⁴ is hydrogen, (C₁-C₄)alkyl, halo(C₁-C₄)alkyl, aryl and aryl(C₁-C₄)alkyl;

K is selected from hydrogen, (C₁-C₃)alkyl, halo(C₁-C₃)alkyl, (C₁-C₃)alkoxy, (C₁-C₃)alkylamino and di(C₁-C₃)alkylamino;

Q is selected from O, S, and NR¹⁴, where R¹⁴ is as previously described;

R¹² and R¹³ are independently selected from hydrogen, (C₁-C₄)alkyl and halo(C₁-C₄)alkyl, and R¹² and R¹³ may be taken together with -T(CHR¹⁴)_m-, where m is an integer of 2 to 4; T is selected from from O, S, and NR¹⁴, where R¹⁴ is as previously described;

-R¹ and R² are independently selected from hydrogen, halogen and (C₁-C₃)alkyl;

-R⁴ is hydrogen;

-R⁵ and R⁶ are independently selected from halogen;

-E is selected from CH₂, O, S and NR¹⁵ where R¹⁵ is selected from hydrogen, (C₁-C₃)alkyl, (C₁-C₃)alkoxy(C₁-C₃)alkyl, aryl(C₁-C₃)alkyl, (C₂-C₄)alkenyl(C₁-C₃)alkyl, halo(C₂-C₄)alkenyl(C₁-C₃)alkyl, di(C₁-C₃)alkylphosphonate, formyl, (C₁-C₃)alkylcarbonyl, halo(C₁-C₃)alkylcarbonyl, (C₁-C₃)alkoxy(C₁-C₃)alkylcarbonyl, arylcarbonyl and (C₁-C₃)alkylsulfonyl;

-G is selected from O, S, CH₂O* and (CH₂)_n where the asterisk denotes attachment to E, and n is an integer selected from 1, 2 and 3, provided that E and G are not simultaneously O or S,

-x is an integer selected from 0 or 1;

and when x is 1,

-A is selected from O, S(O)_p and -NR¹⁵, where p is an integer selected from 0, 1 and 2, and R¹⁵ is as previously described;

-B is a bridging group,

*-(CR¹⁶R¹⁷)_q-(CR¹⁸R¹⁹)_r-(CR²⁰R²¹)_s-L-(CR²²R²³)_u-(CR²⁴R²⁵)_v-(CR²⁶R²⁷)_w-,

where

the asterisk denotes attachment at A; q, r, s, u, v and w are integers independently selected from 0, 1 and 2;

and

when q, r, s, u, v or w are 1 or 2,

R¹⁶ through R²⁷, inclusively, are independently selected from hydrogen, (C₁-C₃)alkyl, halo(C₁-C₃)alkyl, (C₁-C₃)alkoxy(C₁-C₃)alkyl, and (C₃-C₆)cycloalkyl;

t is an integer selected from 0 or 1; and

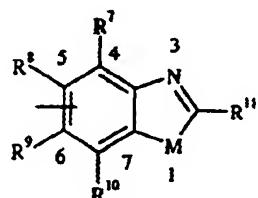
when t is 1.

L is selected from CH=CH; O, S(O)_p; OS(O)₂, S(O)₂O, NR²⁸; N(oxide)R²⁸; NR²⁸SO₂; NR²⁸C(=O)NR²⁹; Si(CH₃)₂; C(=O), OC(=O), NHC(=O); ON=CH; HC=NO; C(=O)O; C(=O)NH; C(=NOR¹⁴) and [CR³⁰R³¹]_z, where p is as previously described, R²⁸ and R²⁹ are independently selected from hydrogen, (C₁-C₃)alkyl, (C₁-C₃)alkylsulfonyl, (C₁-C₃)alkylcarbonyl, (C₂-C₅)alkenyl, and (C₂-C₅)alkynyl; z is an integer selected from 1 or 2; and R³⁰ and R³¹ are independently selected from hydrogen and (C₁-C₃)alkyl;

-y is an integer selected from 0 or 1;

and when y is 1,

-D is selected from O; S(O)_p; and NR¹⁵, where p and R¹⁵ are as previously described, wherein D is attached to the benzo-fused ring moiety set forth in formula I at any one of the positions designated 4-, 5-, 6- or 7-.



-R⁷, R⁸, R⁹ and R¹⁰ are independently selected from hydrogen, halogen, (C₁-C₄)alkyl, (C₃-C₆)cycloalkyl, (C₂-C₅)alkenyl, (C₂-C₅)alkynyl, halo(C₁-C₄)alkyl, (C₁-C₄)alkoxy, halo(C₁-C₄)alkoxy, (C₁-C₄)alkylthio, halo(C₁-C₄)alkylthio, (C₁-C₄)alkylsulfonyl, halo(C₁-C₄)alkylsulfonyl, cyano, nitro, aryl, alkylcarbonylamino, arylcarbonylamino, and (C₁-C₄)alkoxycarbonylamino;

-R¹¹ is selected from hydrogen, halogen, hydroxyl, cyano, (C₁-C₆)alkyl, (C₁-C₆)alkoxy, halo(C₁-C₆)alkyl, halo(C₁-C₆)alkoxy, (C₂-C₆)alkenyl, (C₂-C₆)alkynyl, (C₁-C₆)cycloalkyl, amino, (C₁-C₆)alkylamino, di(C₁-C₆)alkylamino, (C₁-C₆)alkylthio, aryl, arylthio, tri(C₁-C₆)alkylsilyl, SF₅, C(=O)NR¹⁴ and NOR¹⁴ where R¹⁴ is as previously described;

-M is O or S;

and
agriculturally acceptable salts thereof.

2. A compound of claim 1, wherein R and R³ are independently selected from halogen and (C₁-C₃)alkyl;

R⁴, R⁵, and R⁶ are hydrogen;

R⁵ and R⁶ are independently selected from chlorine, bromine, and fluorine;

E is O;

G is (CH₂)_n, where n is 1;

x is 1, and A is O;

and

when q, r, s, u, v and w are 1 or 2, R¹⁶ through R²⁷, inclusively, are hydrogen;

t is 0 or 1,

and

when t is 1,

L is selected from O, OC(=O), NHC(=O), ON=CH, and CH=NO;

y is 1,

and

D is selected from O; S(O)_p; and NR¹⁵, where p is 0, and R¹⁵ is selected from hydrogen, (C₁-C₃)alkyl, aryl(C₁-C₃)alkyl, (C₂-C₄)alkenyl(C₁-C₃)alkyl, and halo(C₂-C₄)alkenyl(C₁-C₃)alkyl, wherein D is attached to the benzo-fused moiety set forth in formula I at the position designated 5 or 6;

R⁷, R⁸, R⁹ and R¹⁰ are independently selected from hydrogen, halogen, halo(C₁-C₄)alkyl and nitro;

and

R¹¹ is selected from (C₁-C₄)alkyl and halo(C₁-C₄)alkyl;

3. A compound of claim 2, wherein R and R³ are independently selected from chlorine and methyl;

R⁵ and R⁶ are independently selected from chlorine and bromine;

q, r, s, u, v and w are 1 or 2, provided that the sum of q, r, s, u, v and w is at least 2 and at most 6;

t is 0;

D is O, wherein D is attached to the benzo-fused moiety set forth in formula I at the position designated as 5 or 6;

R⁷, R⁸, R⁹ and R¹⁰ are hydrogen; and

R¹¹ is methyl or trifluoromethyl.

4. A compound of claim 3, wherein R, R³, R⁵ and R⁶ are each chlorine; q, r and s are 1; u and v are 0 or 1; w is 0; M is O and R¹¹ is trifluoromethyl.

5. A compound of claim 3, wherein R, R³, R⁵ and R⁶ are each chlorine; q, r and s are 1; u and v are 0 or 1; w is 0; M is S and R¹¹ is methyl.

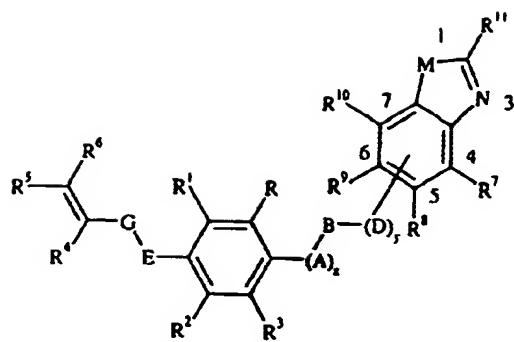
6. A composition comprising an insecticidally effective amount of a compound of claim 1 in admixture with at least one agriculturally acceptable extender or adjuvant.

7. The insecticidal composition of claim 6, further comprising one or more second compounds selected from the group consisting of pesticides, plant growth regulators, fertilizers and soil conditioners.

8. A method of controlling insects, comprising applying an insecticidally effective amount of a composition of claim 6 to a locus where insects are present or are expected to be present.

9. A method of controlling insects, comprising applying an insecticidally effective amount of a composition of claim 7 to a locus where insects are present or are expected to be present.

10. A compound of formula I:



I

wherein

-R and R³ are independently selected from hydrogen, halogen or (C₁-C₃)alkyl;-R¹ and R² are hydrogen;-E is O; G is (CH₂)_n where n is 1;-R⁴ is hydrogen;-R⁵ and R⁶ are independently selected from halogen;

-x is 1 and A is O;

-B is a bridging group

* -(CR¹⁶R¹⁷)_q-(CR¹⁸R¹⁹)_r-(CR²⁰R²¹)_s-L-(CR²²R²³)_u-(CR²⁴R²⁵)_v-(CR²⁶R²⁷)_w.

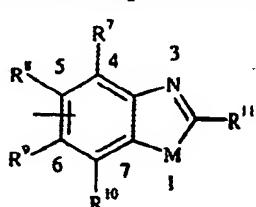
where

the asterisk denotes attachment at A; q, r, s, u, v and w are integers independently selected from 0, 1 and 2; and t is 0;

and

when q, r, s, u, v or w are 1 or 2, R¹⁶ through R²⁷, inclusively, are hydrogen,

-y is 1, and D is O, and wherein D is attached to the benzo-fused ring moiety set forth in formula I at either one of the positions designated 5- or 6-:

-R⁷, R⁸, R⁹ and R¹⁰ are independently selected from hydrogen, halogen or (C₁-C₄)alkyl;

-R¹¹ is selected from (C₁-C₃)alkyl and halo(C₁-C₃)alkyl; and
M is O or S

11. A compound of claim 10, wherein R and R³ are independently selected from chlorine and methyl;
R⁵ and R⁶ are independently selected from chlorine and bromine;
q, r, s, u, v and w are 0, 1 or 2, provided that the sum of q, r, s, u, v and w is at least 2 and at most 6;
R⁷, R⁸, R⁹ and R¹⁰ are hydrogen; and
R¹¹ is methyl or trifluoromethyl.
12. A compound of claim 11, wherein R, R³, R⁵ and R⁶ are each chlorine; q, r and s are 1; u and v are 0 or 1; w is 0; M is O and R¹¹ is trifluoromethyl.
13. A compound of claim 11, wherein R, R³, R⁵ and R⁶ are each chlorine; q, r and s are 1; u and v are 0 or 1; w is 0; M is S and R¹¹ is methyl.